

distinction in Mineral Engineering Chemistry from the Colorado School of Mines, Golden, Colorado in 1972 and a Doctor of Philosophy degree in Geochemistry from the Colorado School of Mines in 1979.

2. From 1975 to 1978, I was an instructor in chemistry and geochemistry at the Colorado School of Mines. I taught courses in general chemistry and quantitative analysis. From 1978 to 1979, I was a senior research chemist with Rockwell International at the Rocky Flats plant. I was responsible for evaluating methods to clean up contaminated soil at Rocky Flats and other Department of Defense facilities. From 1979 to 1983, I was a project supervisor with D'Appolonia Consulting Engineers. In 1983, International Technology (IT) acquired the portion of D'Appolonia for which I worked. At D'Appolonia and IT, I performed many evaluations related to environmental contamination. In 1985, I joined CDM where I continued to evaluate environmental contamination. I have extensive experience in performing environmental investigations and studies, evaluating the environmental fate and transport of chemicals in the environment and determining the cause or source of contamination in the environment. In all, I have worked on or evaluated environmental conditions at over 500 sites. I am the author or coauthor of over 120 publications/presentations and over 400 technical reports relating to environmental contamination.

3. In November 2004, CDM was retained by the Oklahoma Attorney General to perform investigations concerning poultry waste in the Illinois River

Watershed (IRW). I have been CDM's project technical director since inception of the project. In this capacity, I have helped plan and direct systematic investigations of the environmental contamination found in the IRW. The investigations included collection and laboratory analyses of poultry waste, soils, surface waters, groundwaters and sediments through out the IRW. Specifically, investigations were performed to determine if a cause and effect link exists between poultry waste land disposal and observed environmental contamination in the IRW.

4. As part of these investigations, the chemical and bacterial characteristics were determined in each major environmental component or compartment in the IRW that could show a pathway and link between the observed contamination in the IRW and poultry waste land disposal. This type of investigation is a pathway sampling approach because the results show a direct path from the place of poultry waste disposal to the locations in the IRW where contamination is found. Therefore during these investigations, samples were collected from all major pathway components to provide an evaluation of the pathway from the poultry waste disposal to waters and sediments in the IRW. These components include poultry waste from poultry houses, soils from fields on which poultry waste had been applied, water runoff during and after rainfall events from the edges of fields on which poultry waste had been applied, water from springs in the IRW, groundwater in the IRW, water and sediments from rivers and streams in the IRW, and water and sediments from Tenkiller Ferry

Reservoir. These components represent a complete "step-by-step" pathway of the chemicals and bacterial contaminants from the source (land applied poultry waste) to ultimate deposition (the waters and sediments of the IRW).

5. The investigations included analyzing the poultry waste, surface water, groundwater, soil and sediment samples for an extensive list of chemical and bacterial parameters. The purpose of the extensive list of parameters was to determine if poultry waste contains and subsequently creates a unique and distinctive chemical/bacterial signature that can be identified in the various pathway components of the IRW. If a poultry waste signature exists, the fate and transport of the chemicals and bacteria from the poultry waste can be traced through out the IRW and poultry waste components can be specifically identified in the IRW waters and sediments. Depending upon the type of samples and environmental component (soil, water, etc.), a large list of individual parameters was analyzed at analytical and microbiological laboratories. The analyses included an extensive list of metals and semimetals, nutrients, general water quality parameters and bacteria. Thousands of samples have been collected and analyzed including poultry waste samples, soil samples, edge of field runoff samples, spring samples, groundwater samples, stream and river water samples, Tenkiller Ferry Reservoir water samples, river sediment samples and Tenkiller Ferry Reservoir sediment samples.

6. Based on scientific literature and laboratory analyses of poultry waste samples collected from the Defendants' facilities in the IRW, the poultry waste contains a large number and variety of chemical and bacterial components including large concentrations of phosphorus, bacteria, organic carbon, potassium, copper, zinc and nitrogen compounds. The combination and concentrations of this large list of components in the poultry waste are unique and distinct. The result is a definitive poultry waste signature that can be specifically recognized and identified in the environment of the IRW where such wastes components have been transported.

7. Based on existing and historical data and laboratory analyses of poultry waste and soil samples in the IRW, the major chemical and bacterial components in the poultry waste are also found in the soils in the fields on which the poultry waste has been applied. Based on historical data and laboratory analyses of environmental samples collected in the IRW, the chemical and bacterial components present in the poultry waste are also found in all other major environmental compartments through out the IRW including runoff water from fields on which poultry waste has been applied, water from streams and rivers down stream from fields containing poultry waste, springs transmitting groundwater, groundwater in aquifers, water in Tenkiller Ferry Reservoir and sediments from streams and rivers in the IRW and from Tenkiller Ferry Reservoir. Thus, the poultry waste signature was identified in all of the major environmental compartments throughout the IRW. The poultry waste and

the poultry waste signature contain bacteria. The poultry waste bacteria found through out the basin includes total coliform, fecal coliform, *E. coli* and *enterococcus*. These bacteria are found in samples with the poultry waste signature. A significant source of the bacteria found in the environment through out the IRW is the poultry waste.

8. The environmental samples that contain the signature of poultry waste demonstrate a complete pathway of transport of poultry waste components from the fields where poultry waste was applied to the IRW waters and sediments via runoff during precipitation events into streams and rivers; percolation of waste components into the groundwater and then to the springs and into the streams and rivers in the IRW; and finally into Tenkiller Ferry Reservoir waters and sediments.

9. The unique and distinct combination of chemicals and bacterial components found in the poultry waste, i.e. the poultry signature, is present in environmental samples collected through out the IRW. The signature is typically defined by over 20 different parameters including various forms of phosphorus and bacteria. The combination of chemicals and bacterial components found in the environmental samples collected through out the IRW are unique and distinct. This signature is not present in samples collected from streams and rivers in areas with no poultry waste disposal.

10. The evaluations discussed above demonstrate that the Defendants' poultry waste is a significant source of the associated chemicals and microbiological components, including phosphorus and bacteria, found throughout the environment of the IRW. Continued disposal of poultry waste on fields in the IRW will continue to result in the poultry waste being a significant source of bacteria in the environment of the IRW.

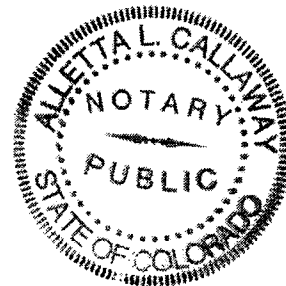
FURTHER AFFIANT SAYETH NOT.

Roger L. Olsen
Roger L. Olsen

Subscribed and sworn to me by Roger L. Olsen, on the 26th day of October, 2007.

Alletta Callaway
Signature

Alletta Callaway
Printed Name



Notary Public, State of Colorado, County of Denver

My Commission Expires: July 31, 2008